

REMARKS

The Examiner's indication of the allowable subject matter of claims 14-18 is noted with appreciation.

Claims 20-39 are pending in the application. Claims 1-19 have been cancelled and rewritten in form of new claims 20-38, respectively. Claim 39 has been further added to provide Applicants with the scope of protection to which they are believed entitled.

New claims 33-37 include the allowable subject matter indicated in paragraph 9 of the Office Action, and correspond to original claims 14-18. Applicants respectfully submit that new claims 33-37 are now in condition for allowance. Early indication of same is courteously solicited.

The claims have been rewritten to better define the present invention over the applied art of record. Note that this claim amendment has been made solely for the purpose of accelerating prosecution and not for any reasons related to patentability. The art rejections manifested in paragraphs 5-7 of the Office Action are erroneous and therefore traversed because the applied references are not properly combinable.

Liu teaches a method of compensating for distortion of a captured symbol image wherein one or more sampling paths through the deformed symbol are constructed based on a three-dimensional model of the symbol. The deformed symbol image is referenced by a Cartesian coordinate system so that the location (position and orientation) of each pixel of the deformed image is arithmetically determined using known geometric and trigonometric properties based on the coordinate system. Each pixel which has been determined is therefore represented by a pair of numbers indicating the horizontal and vertical position of the pixel in the deformed image.

Thus, Liu's method is a well known conventional method which has been discussed in the background section of the application as filed. See page 2, line 26 to page 3, line 2 of the specification. A drawback associated to this method is that it requires many computational

complex operations and a considerable calculation time since all the points or pixels of the image need to be transformed. See page 3, lines 4 to 9 of the specification. Therefore, there is a need for a method requiring lower computational operations and less calculation time.

The Applicant's invention as claimed in amended claim 20 solves the above problem by providing a method comprising the following steps:

- (a) generating a regular grid including a plurality of notable points each corresponding to one of the code elements of the optical code;
- (b) generating a grid of the deformed image to identify a plurality of characteristic points in the deformed image, each of the characteristic points corresponding to one of the notable points; and
- (c) generating on the regular grid a undistorted image by means of a geometrical transformation correlating the characteristic points and the notable points.

Advantageously, by using two grids (a regular grid for the undistorted image and a deformed grid for the deformed image) having two sets of notable points and characteristic points, respectively, which correspond with each other by means of a geometrical transformation, it is possible to correct distortion of the deformed image and to drastically reduce the operations and the time required to eliminate such distortion, since the transformation operations are carried out **only for selected points** (one point for each element of the code) **rather than for every pixels** of the deformed image.

As noted by the Examiner in paragraph 5 of the Office Action, Liu lacks the teaching of a grid. The Examiner then proposed to cure this deficiency with the Yoshida reference which teaches to use a grid laying over mark areas defined on a deformed display area. However, Yoshida does not teach nor suggest **a regular grid of notable points which are correlated to characteristic points of the deformed image by means of a geometrical transformation**. Therefore, even if Yoshida and Liu were combinable in the manner proposed by the Examiner, which Applicants contend to the contrary, the references would still fail to teach or disclose all limitations of new

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claim 20, i.e. limitations (a) and (c). These missing features are not supplied by any of the remaining applied references, namely, Fukuda and Szeliski.

Accordingly, Applicants respectfully submit that new claims 20-39 are patentable over the applied art of record.

Each of the Examiner's rejections has been overcome/traversed. Accordingly, Applicants respectfully submit that all claims are now in condition for allowance. Early and favorable indication of allowance is courteously solicited.

The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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